Construction Trends -- 2006

Bob Tippee
Editor, Oil & Gas Journal
Rice E&C Forum
April 21, 2006
OGJ editors in attendance

- Warren R. True, Chief Technology Editor—LNG/Gas Processing, and Editor, LNG Observer
- David N. Nakamura, Refining/Petrochemical Editor
Worldwide Construction Update

OGJ, April 24, 2006

Refineries

Petrochemicals

Gas processing (including LNG)

Sulfur

Gas to Liquids

Pipeline
Global refining capacity

Refining margins

Source: Jamieson, OGJ, 3/13/06.
Demand, capacity—2005-15

Source: Jamieson, OGJ, 3/13/06.
Project ranking—2005-15

Source: Jamieson, OGJ, 3/13/06.
Realistic capacity additions

Source: Jamieson, OGJ, 3/13/06.
Regional additions, 2005-15

Source: Jamieson, OGJ, 3/13/06.
OPEC: refining capacity

Distillation Capacity Additions vs Incremental Crude Runs

- Low Growth
- Reference case
- High Growth
- Optimistic
- Realistic

mb/d

OPEC: product demand

Global product demand 2015 vs 2005

- Ethane
- LPG
- Naphtha
- Gasoline
- Jet/Kero
- G/D oil
- Fuel oil
- Other *

* Includes bitumen, lubricants, waxes, still gas, coke, sulphur, direct use of crude oil, refinery fuel oil etc.
OPEC: desulfurization
OPEC: investment

Refinery investments in the reference case
2005-2015

(existing projects) - (required additions) - (maintenance/capacity replacement)

billion US$ (2005)

USA/Canada - Latin America - Africa - Europe - FSU - Middle East - Asia/Pacific
Global ethylene capacity additions

Source: OGJ, Mar. 27, 2006, from Chem Systems and OGJ data.
The cyclic ethylene market

Source: Lehman Bros. in OGJ, Mar. 27, 2006.
Ethylene feedstock

Source: Chemical Market Associates Inc. (CMAI) in OGJ, 3/27/06.
Ethylene demand

Source: CMAI in OGJ, 3/27/06.
Ethylene trade

Source: CMAI in OGJ, 3/27/06.
Ethylene additions

Note: Quarterly bars in 1,000 metric tons/year

Source: Lehman Bros. in OGJ, 3/27/06.
Propylene demand

Source: Mark Eramo, CMAI in OGJ, 12/5/05.
Propylene supply

Source: Eramo, CMAI in OGJ, 12/5/05.
Propylene trade

Source: Eramo, CMAI in OGJ, 12/5/05.
World LPG demand

Source: Ajey Chandra, Ron Gist, Ken Otto, S. Craig Whitley, Purvin & Gertz Inc (P&G) in OGJ, 6/27/05.
World LPG supply

Source: P&G in OGJ, 6/27/05.
World LPG trade

Source: P&G in 6/27/05.
LNG construction outlook

LNG regional capacity

## Gas to liquids (survey)

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of plants</th>
<th>Tot. capacity (b/d)</th>
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</thead>
<tbody>
<tr>
<td>Bolivia</td>
<td>1</td>
<td>10,000</td>
</tr>
<tr>
<td>Chile</td>
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<td>10,000</td>
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<tr>
<td>Iran</td>
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<td>110,000</td>
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<tr>
<td>Nigeria</td>
<td>1</td>
<td>34,000</td>
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<tr>
<td>Qatar</td>
<td>3</td>
<td>328,000</td>
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Forecast pipeline construction